UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,935	01/16/2004	Brian Barrick	AUS920030971US1	8219

50170 7590 07/31/2006		**EXAMINER**
IBM CORP. (WIP)		KROFCHECK, MICHAEL C
c/o WALDER INTELLECTUAL PROPERTY LAW, P.C.		

ART UNIT	PAPER NUMBER
2186	

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DATE MAILED: 07/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/759,935	BARRICK, BRIAN
	Examiner	Art Unit	
	Michael Krofcheck	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7-11,15-19 and 31-44* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *31-44* is/are allowed.

6)☒ Claim(s) *7-11 and 15-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   This office action is in response to the amendment filed on 5/31/2006.

2.   Claims 1-6, 12-14, and 20-30 have been cancelled.

3.   Claims 31-44 have been added.

4.   The objections/rejections from the prior correspondence not restated herein have

been withdrawn.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

    1.   Determining the scope and contents of the prior art.
    2.   Ascertaining the differences between the prior art and the claims at issue.
    3.   Resolving the level of ordinary skill in the pertinent art.
    4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

7.   Claims 7-11 rejected under 35 U.S.C. 103(a) as being unpatentable over Witt,

US patent 6141747, Akkary et al., US patent application publication 2001/0014941, and

Dautelle, US patent application publication 2004/0015740.

8.   With respect to claim 7, Witt teaches of a method for entering at least one

command into a plurality of command queues, comprising: determining which command

queue of the plurality of command queues at least corresponds to the at least one

command (fig. 2; column 12, lines 19-29, column 13, lines 26-33; the store queue stores

outstanding store operations within the processor and the load/store queue stores load

operations that miss the data cache; it is determined that a store operations is stored in

the store queue);

entering the at least one command into the command queue that corresponds

(fig. 2; column 12, lines 19-29, column 13, lines 26-33;);

updating a valid bit to indicate that a queue location is valid (fig. 2, 3; column 16,

lines 5-10);

Witt fails to explicitly teach of upon entering the at least one command,

taking a snapshot of the order of each of the plurality of command queues, determining

if the command is dependent on any other commands to indicate if dependencies exist,

and if any dependencies exist, updating at least one dependency in a dependency bit.

However, Akkary teaches of determining if the command is dependent on any

other commands to indicate if dependencies exist; and if any dependencies exist,

updating at least one dependency in a dependency bit (fig. 13, paragraph 0119-0120;

where the dependency bits are computed sequentially).

Dautelle teaches of after entering a command taking a snapshot of the order of the command queue (fig. 1, 3; paragraph 0051, 0061; where a snapshot of the commands provided by the dynamic snapshot generator is stored in the storage device. It is abundantly clear to one of ordinary skill in the art that as the snapshot of the command queue contains the order of the commands. As the commands are being stored in the snapshot in the storage device, it is clear that it is after commands are put in the queue in the snapshot generator).

Witt and Akkary are analogous arts as they are both in the same field of endeavor, out-of-order processing systems. It would have been obvious to one of ordinary skill in the art having the teachings of Witt and Akkary at the time of the invention to include the dependency field for each instruction of Akkary in the store and load/store queues in Witt. Their motivation would have been to enable procesors to concurrently execute different threads from the same program where there are dependences among the threads (Akkary, paragraph 0009).

The combination of Witt and Akkary, and Dautelle are analogous arts as they are both in the same field of endeavor, computer systems keeping track of commands. It would have been obvious to one of ordinary skill in the art having the teachings of Witt, Akkary, and Dautelle at the time of the invention to create snapshots of the queues in the combination of Witt and Akkary as taught in Dautelle. Their motivation would have been to allow for playback of the system states, Dautelle paragraph 0011.

9.   With respect to claims 8, and 10, Witt teaches of the limitations cited with respect to claims 2 and 4 respectively.

10.   With respect to claim 9, Witt teaches of wherein the method further comprises if the command at least corresponds to the strict order queue, entering the at least one command into the strict order queue in a location indicated by a newest entry pointer (fig. 5; column 18, lines 21-36; where the store queue's head and tail pointers are incremented and decremented to add and delete stores to the queue).

11.   With respect to claim 11, Witt teaches of wherein the method further comprises if the command at least corresponds to the stack down order queue, entering the at least one command into the stack down order queue; and upon entering, updating an identification bit to at least track the command (fig. 1; column 6, lines 3-5; column 8, lines 58-61; where each instruction is assigned a queue number identifying the location within the instruction queues assigned to store the instruction operation.   It is abundantly clear to one of ordinary skill in the art that this is done to identify/enable tracking of the instruction).

12.   Claims 15-19, rejected under 35 U.S.C. 103(a) as being unpatentable over Witt, Akkary, Dautelle, and Eisen.

13.   With respect to claims 15-19, Witt, Akkary, and Dautelle teach of the limitations cited with respect to claims 7-11. It is abundantly clear to one of ordinary skill in the art that the previously cited limitations are operated under control of a processor executing a program. Eisen teaches of a computer program product embodied on a computer medium (column 7, lines 48-67).

Witt and Akkary are analogous arts as they are both in the same field of endeavor, out-of-order processing systems.   It would have been obvious to one of

ordinary skill in the art having the teachings of Witt and Akkary at the time of the invention to include the dependency field for each instruction of Akkary in the store and load/store queues in Witt. Their motivation would have been to enable procesors to concurrently execute different threads from the same program where there are dependences among the threads (Akkary, paragraph 0009).

The combination of Witt and Akkary, and Dautelle are analogous arts as they are both in the same field of endeavor, computer systems keeping track of commands. It would have been obvious to one of ordinary skill in the art having the teachings of Witt, Akkary, and Dautelle at the time of the invention to create snapshots of the queues in the combination of Witt and Akkary as taught in Dautelle. Their motivation would have been to allow for playback of the system states, Dautelle paragraph 0011.

The combination of Witt, Akkary, and Dautelle and Eisen are analogous arts as they are both in the same field of endeavor, out-of-order processing systems. It would have been obvious to one of ordinary skill in the art having the teachings of Witt, Akkary, Dautelle and Eisen at the time of the invention to include the control code in the combination of Witt, Akkary, and Dautelle as a computer program product on a computer medium. Their motivation would have been to provide mobility and ease of upgrading.

Allowable Subject Matter

14.   Claims 31-44 are allowed.

15.   The following is a statement of reasons for the indication of allowable subject

matter:

    a.   With respect to claims 31-44, specifically independent claims 31 and 38,

the prior art fails to teach of setting the validation bit portion and the set of

dependency bits in the command entry based on the snapshot of the opposing

command queue.

Response to Arguments

16.   Applicant's arguments filed on 5/31/2006 have been fully considered but they are

not persuasive.

17.   The applicant argues that Dautelle is nonanalogous art.   The examiner

disagrees.   The system of Dautelle is analogous art.   It is a computer system utilizing

command queues just as Witt, Akkary, and the applicant's invention.   That one

embodiment of Dautelle's computer system is used as an air traffic controller system,

which stores display commands in the queue of which the snapshot is taken (paragraph

0013) does not make it nonanalogous.   It is still in the same field comprising computer

systems processing commands with command queues.   Furthermore, Dautelle states

that the invention is, "a system and method for storing and playing back a state of a

computer system," (paragraph 0003).   It is not applicable to only air traffic control

systems.

18.   In response to applicant's argument that the examiner's conclusion of

obviousness is based upon improper hindsight reasoning, it must be recognized that

any judgment on obviousness is in a sense necessarily a reconstruction based upon

hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

19.   The applicant's also argues that the combination of Witt, Akkary and Dautelle, specifically Dautelle, as stated in the prior correspondence is motivated by the ability to concurrently execute different threads from the same program where there are dependencies among the threads. This is not what is stated in the office action dated 3/1/2006. The examiner refers the applicant to pages 7 and 8. The motivation for one of ordinary skill in the art to combine Dautelle with the combination of Witt and Akkary is "to allow for playback of the system state," (Dautelle, paragraph 0011). This allows one to review prior states to determine errors, aid in evaluating efficiency of the system, providing a backup in case of data loss, and any number of other reason that are known in the art for taking snapshots.

Conclusion

20.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

21.   A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

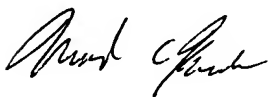TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

22.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Krofcheck whose telephone number is 571-272-8193. The examiner can normally be reached on Monday - Friday.

23.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

24.   Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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